Department of Marine Resources
Site Review

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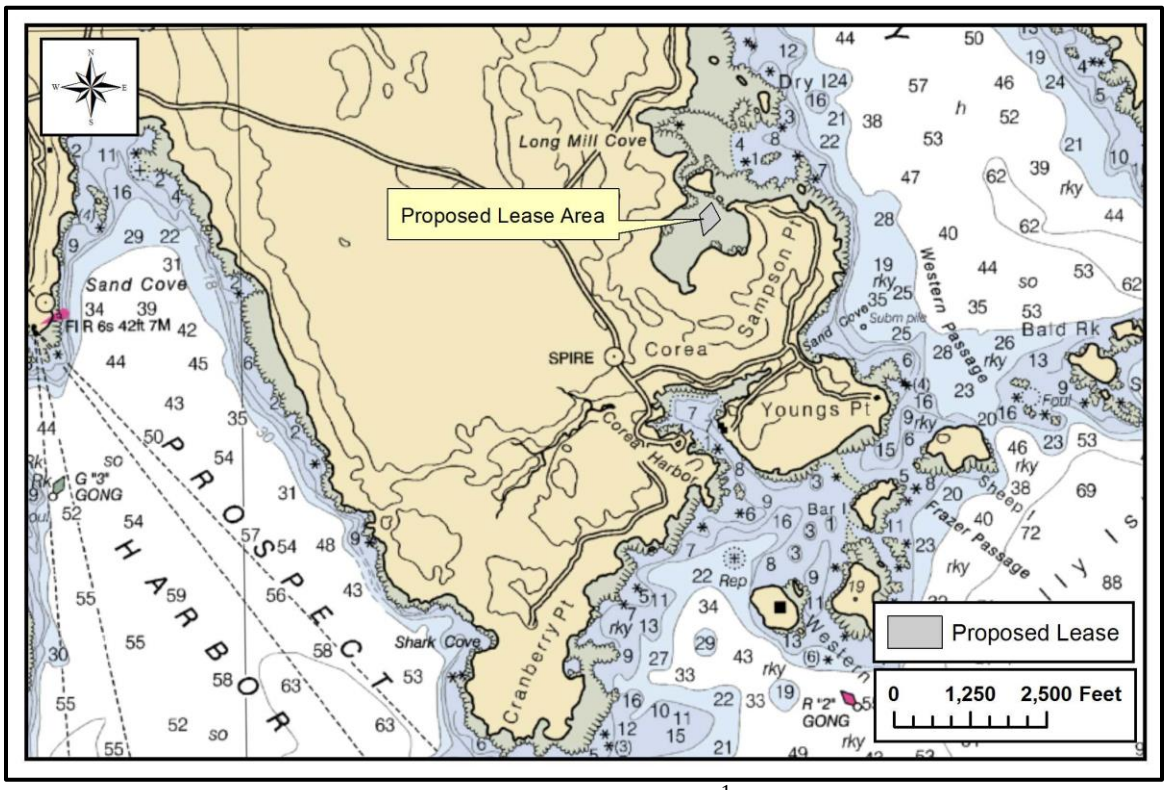

Figure 1. Vicinity map[1]

Location: Millpond, Long Mill Cove, Gouldsboro Bay, Gouldsboro, Hancock County, Maine

Purpose: Standard lease for the bottom and suspended culture of American/eastern oysters (*Crassostrea virginica*)

Site Review by: Flora Drury and Cheyenne Adams
Report Preparation by: Flora Drury, Cheyenne Adams, and Marcy Nelson

Report Submitted: April 9, 2021

[1]Unless otherwise noted, all figures in this report were created in ArcMap version 10.6 using digitized NOAA Nautical Charts or geo-referenced aerial photographs provided by The Maine Office of GIS (*orthoCoastalDownEastCoast2009*).

Application Summary

The applicant is requesting 2.32[2] acres in the millpond located in Long Mill Cove in Gouldsboro Bay for the bottom and suspended culture of American/eastern oysters (*Crassostrea virginica*). The applicant proposes to use the majority of the site for gearless bottom planting. Bottom planted oysters would be harvested by hand, with a clam rake, or with oyster tongs.[3] The applicant also proposes to deploy up to 9 oyster condos (45" x 36" x 20") and up to 9 wire cages (44" x 24" x 15") on the proposal, near proposed corner D.[4] Gear would be deployed from November to May and would hold soft mesh bags containing oysters. [5]

General Site Characteristics

The proposed lease is located in the millpond located in Long Mill Cove in Gouldsboro Bay (Figure 1, Images 1-5). The shoreline of the millpond is rocky, with a sandy beach on a bar located to the northeast of the proposal. The surrounding uplands host a mixed forest, and a single house was observed. Two small boats, aquaculture gear associated with the applicant's Limited Purpose Aquaculture (LPA) licenses, and multiple moored floats were observed within the millpond during MDMR's site visit. A narrow channel connects the millpond to Long Mill Cove (Image 6). According to the applicant, because the millpond's elevation is 5 or 6 feet higher than Gouldsboro Bay, low water in the millpond occurs approximately 2 hours before high tide in Gouldsboro Bay.[6] This is because water stops flowing out of the millpond when the tidal height in Gouldsboro Bay reaches the elevation of the millpond.

Maine Department of Marine Resources (MDMR) Scientists Flora Drury and Cheyenne Adams visited the proposed lease site on October 6, 2020. During MDMR's site visit, water within the millpond switched from ebb to flood.

[2] The application requests 2.2 acres, but DMR calculations, based on the application coordinates, indicates that the area is 2.32 acres.
[3] Application, page 7
[4] Application, page 4
[5] Application, page 27
[6] Application, page 21

Image 1: Looking east across the millpond toward the sandy beach and bar, from the shoreline to the northwest of the proposed lease (October 6, 2020).

Image 2: Looking southeast across the millpond toward the shoreline to the northwest of the proposed lease. The applicant's Limited Purpose Aquaculture (LPA) license gear and a moored float can be seen in the foreground (October 6, 2020).

Image 3: Looking southwest across the millpond from the shoreline to the northwest of the proposed lease. Boats owned by the applicant can be seen in the foreground (October 6, 2020).

Image 4: Looking west along the shoreline of the millpond from the shoreline to the northwest of the proposed lease (October 6, 2020).

Image 5: Looking north from the shoreline to the northwest of the proposed lease (October 6, 2020).

Image 6: Looking east across the entrance of the millpond (October 6, 2020).

Figure 2: Proposed lease area and dive transects conducted within the proposed lease area on October 6, 2020.

Depth

The surrounding geography and bathymetry of the millpond causes tidal changes to occur at different times than tidal changes in Gouldsboro Bay. On October 6, 2020, DMR staff arrived onsite at approximately 11:00 am and stayed onsite until approximately 12:30 pm. Low tide in Gouldsboro Bay was predicted at 8:01 am on this date. However, according to the applicant, low tide in Mill Pond occurs approximately 2 hours before high tide in Gouldsboro Bay, which was predicted at 2:06 pm.[7] Due to this, DMR staff was onsite when the tide changed within the millpond. The proposed lease site was subtidal at low water within the millpond on October 6, 2020.

Table 1: Tide predictions at Garden Point, Gouldsboro Bay, Maine (44.4683° N, 67.9700° W)[8]

Date	Time	Height (ft.)
10/6/20	8:01 AM	1.58 L
10/6/20	2:06 PM	10.95 H
10/6/20	8:31 PM	0.92 L

[7] Application, page 22
[8] http://tbone.biol.sc.edu/tide/tideshow.cgi

Bottom Characteristics

MDMR staff observed the bottom characteristics of the proposed lease site via dive transect on October 6, 2020 (Figure 2). The sediment was classified using the Coastal and Marine Ecological Classification Standard,[9] a national standard for describing features of the marine environment (Table 2). Sediments were categorized based on visual analysis; no sediment samples were collected, or grain size analyses performed. The bottom of the proposed lease area transitions from gravel and shell rubble to sandy mud, from east to west (Images 7-9). This is likely due to the narrow entrance of the millpond, which causes the eastern side of the millpond to experience stronger currents than the western, more interior, side of the pond.

Table 2. Substrate classification on proposed lease site.

Substrate Origin	Substrate Class	Substrate Subclass	Substrate Group
Geologic Substrate	Unconsolidated Mineral Substrate	Course Unconsolidated Substrate	Gravel
Biogenic Substrate	Shell Substrate	Shell Rubble	--
Geologic Substrate	Unconsolidated Mineral Substrate	Fine Unconsolidated Substrate	Sandy Mud

Image 7: Gravel and shell rubble on the bottom of the eastern portion of the proposed lease (October 6, 2020).

[9] https://www.fgdc.gov/standards/projects/cmecs-folder/CMECS_Version_06-2012_FINAL.pdf

Image 8: Gravel, shell rubble and sandy mud on the bottom of the center of the proposed lease (October 6, 2020).

Image 9: Sandy mud on the bottom of the western portion of the proposed lease (October 6, 2020).

Position and Distances to Shore

The measuring tool and coordinate geometry (COGO) report tool in ArcMap 10.6 were used to verify the distances and bearings between proposed lease corners. Distances to shore were determined using the measuring tool in ArcMap 10.6, digital orthophotography provided by the Maine Office of GIS, and the application coordinates.

Application Coordinates – 2.32 Acres (Figure 2)

Corner	Latitude	Longitude
A	44° 24’ 30.8” N	67° 58’ 13.2” W then 279.89 feet at 225.85° True to
B	44° 24’ 28.9” N	67° 58’ 16.0” W then 360.22 feet at 168.83° True to
C	44° 24’ 25.4” N	67° 58’ 15.1” W then 391.13 feet at 45.61° True to
D	44° 24’ 28.07” N	67° 58’ 11.2” W then 312.32 feet at 331.62° True to A.

Table 3. Approximate distances from the proposed lease to surrounding features (Figures 1 & 2). Measurements were made using digital orthophotography provided by the Maine Office of GIS (*orthoCoastalDownEast2009*) and NOAA Nautical Charts.

Feature	Distance
Corner A to sandy beach to the northeast (aerial photography)	~100 feet to the northeast
Corner A to nearest uplands of island off Sampson Point	~250 feet to the northwest
Corner B to nearest millpond uplands	~290 feet to the northwest
Corner C to nearest millpond uplands	~180 feet to the southeast
Corner D to nearest Sampson Point uplands	~325 feet to the northeast

The criteria MDMR uses to determine the suitability of an aquaculture operation to an area (MDMR Regulations Chapter 2.37(1)(A)) are discussed, with respect to the proposal, below:

(1) Riparian Ingress and Egress

The proposed lease is located in the millpond in Long Mill Cove in Gouldsboro Bay. No docks were observed in the millpond during the October 6, 2020 site visit. Multiple moored floats and two small vessels owned by the applicant,[10] were located within the millpond at the time of the site visit. As the majority of the proposed lease would be free of gear, it is unlikely to pose an unreasonably interference to riparian access along the shoreline of the pond. Furthermore, the applicant is one of the riparian landowners.

(2) Navigation

The millpond in which the proposal is located is connected to Long Mill Cove, and therefore Greater Gouldsboro Bay, by a narrow channel. At certain tidal stages, a fast current develops in this channel which limits the times at which it is safe to navigate into the millpond from Greater Gouldsboro Bay. Due to this, and because of the shallow nature of the millpond which naturally constrains the types of vessels that could operate in the area, it is likely that boating is limited in the millpond. During the site visit on October 6, 2020, two small, hand-powered boats were observed in the millpond, which are owned by the applicant.[11] As the majority of the proposed lease would be used for bottom planting, other small vessels that might navigate

[10] Email communication between F. Drury and J. Young on 4.6.2021.
[11] Conversations between C. Adams and J. Young on 10.06.20 and email communication between F. Drury and J. Young on 4.6.2021.

within the millpond, such as kayaks, would be able to navigate around and over the proposed lease area without hindrance.

(3) Fishing and Other Uses

During the site visit conducted on October 6, 2020, a single buoy and trap was set in the millpond. Other traps were observed stacked on a moored float (Image 2). The applicant indicated to MDMR staff that he occasionally sets traps in the millpond to capture green crabs (*Carcinus maenas*).[12] Additionally, blue mussels (*Mytilus edulis*) were observed in the eastern portions of the millpond during the dive transect, with the highest density of this species observed outside of the proposed lease area, in the millpond's narrow entrance. Due to the natural limitations to navigation in and out of the millpond, it is likely that access for most commercial fishing that might occur in the millpond would occur over land, as opposed to by boat.

The applicant requests that commercial fishing activities be restricted from the lease area to prevent damage to the oysters.[13] Due to the natural limitations to commercial fishing in the area, and because the proposed lease area encompasses less than one quarter of the millpond, it is unlikely that the proposed lease operations and exclusive use would unreasonably hinder commercial fishing activities in the area.

(4) Other Aquaculture Uses

At the time this report was published, there were no active leases within 1 mile of the proposed lease. Four active Limited Purpose Aquaculture (LPA) licenses held by the applicant are located several hundred feet to the northwest of the proposal (Figure 3 & Image 10). According to the application, these LPA licenses would remain active if the proposed lease is granted.

[12] Email communication between F. Drury and J. Young on 4.6.2021.
[13] Application, page 13

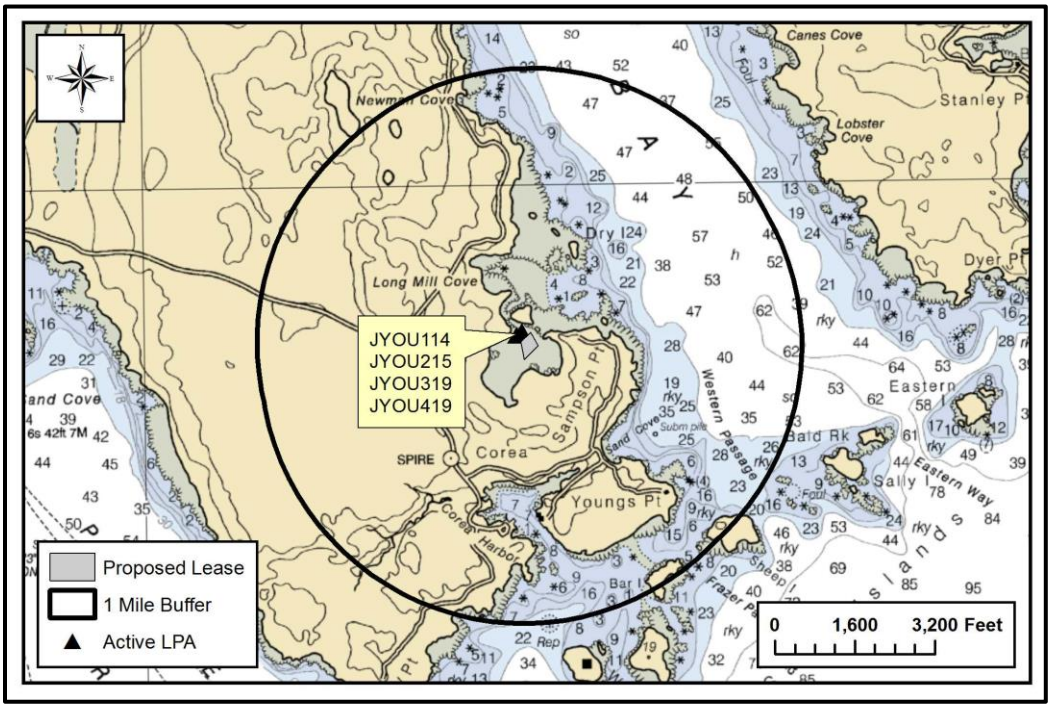

Figure 3. Active Limited Purpose Aquaculture (LPA) licenses in the vicinity of the proposed lease.

Image 10: LPA license gear in the vicinity of the proposed lease (October 6, 2020).

(5) Existing System Support

On October 6, 2020 MDMR staff conducted a dive transect through the proposed lease to assess the epibenthic ecology of the area (Figure 2). The bottom of the proposed lease area transitions from gravel and shell rubble to sandy mud, from east to west (Images 7-9). Mussel shells (*Mytilus edulis*) and periwinkle shells (*Littorina littorea*) dominated shell debris; soft shell clam (*Mya arenaria*) shells were also common. Epibenthic macro flora and fauna observed during the dive transect are described in Table 4 (Images 11-13).

Table 4. Species observed from dive transect conducted within the proposed lease site on October 6, 2020.

Species Observed	Abundance
Blue mussel (*Mytilus edulis*)	Abundant on eastern portion
Common periwinkle (*Littorina littorea*)	Abundant
American oyster (*Crassostrea virginica*)	Common
Green crab (*Carcinus maenas*)	Common
Slippersnail (*Crepidula sp.*)	Common
Coraline algae	Common
Unidentified algae	Common
Barnacle (*Semibalanus balanoides)*	Common
Sugar kelp (*Saccharina latissima*)	Rare
Various rockweed species	Rare

Image 11: Blue mussels (*M. edulis*) observed during October 6, 2020 dive transect.

Image 12: Slippersnail (*Crepidula sp.*) observed during October 6, 2020 dive transect.

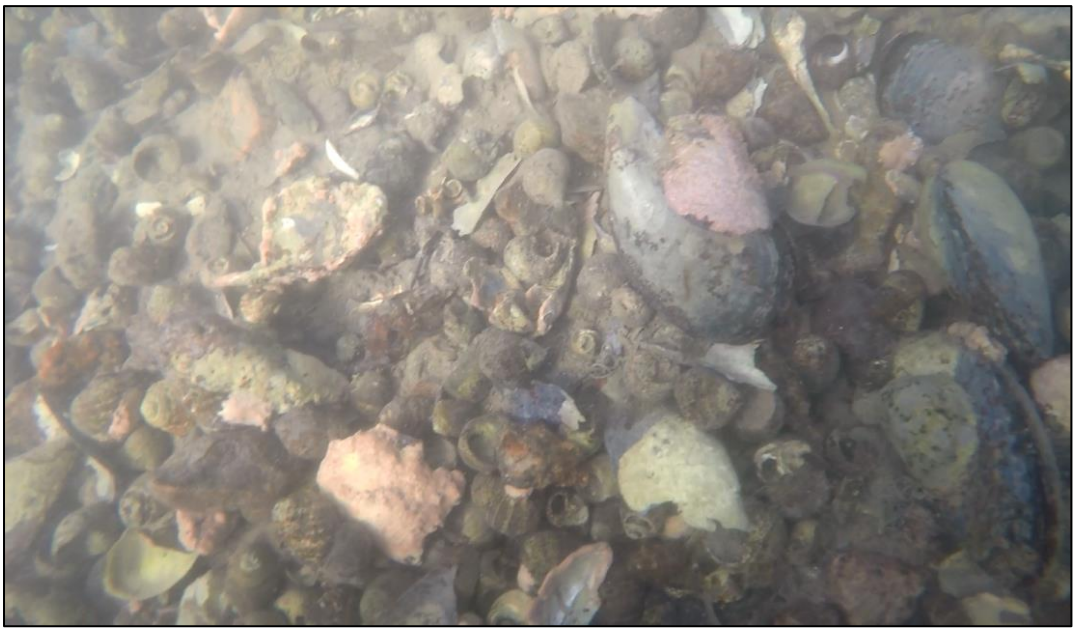

Image 13: Coraline algae observed during October 6, 2020 dive transect.

Eelgrass (*Zostera marina*)

The most recent eelgrass (*Zostera marina*) data, collected in 2009 by the Maine Department of Marine Resources, indicate that the closest eelgrass beds were located outside of the millpond, over 800 feet from the proposal (Figure 4). No attached eelgrass was observed during the SCUBA transect conducted within the proposed lease on October 6, 2020.

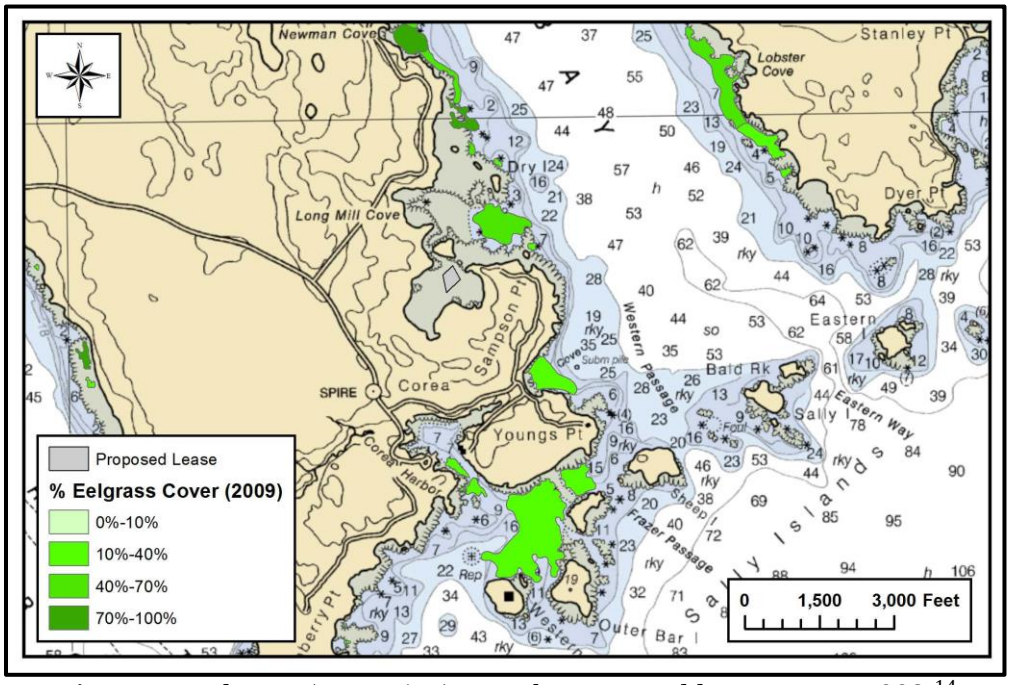

Figure 4: Eelgrass (*Z. marina*) near the proposed lease site, in 2009.[14]

Wildlife

According to GIS (Geographic Information System) data of Significant Wildlife Habitat maintained by the Maine Department of Inland Fisheries and Wildlife (MDIF&W) and available through the Maine Office of GIS, the proposed lease overlaps shorebird habitat, along with emergent wetland/mudflat complex listed as Tidal Waterfowl and Wading Bird Habitat (Figure 5).

On November 13, 2020 Rebecca Settele (Wildlife Biologist, MDIF&W) responded by email to a "Request for Agency Review and Comment", recommending that any boats used in the operations do not ground out on reefs, aquatic beds, and mud flats and also that the project footprint and float size be reduced to the minimum size needed to have the least impact on waterfowl and wading bird populations.

[14]Data obtained from MEDEP maintained SDE Feature Class "GISVIEW.MEDEP.Eelgrass2018"

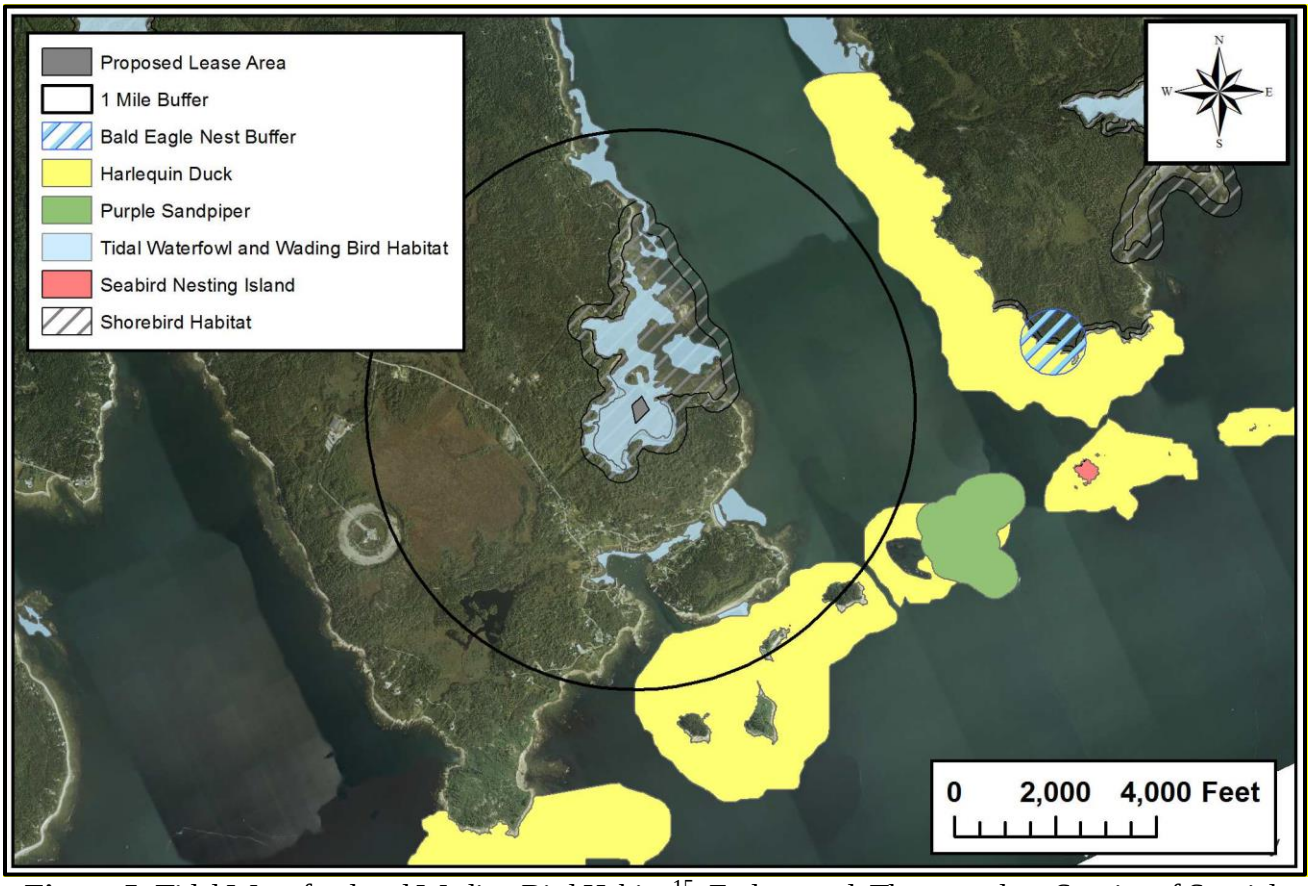

Figure 5. Tidal Waterfowl and Wading Bird Habitat[15], Endangered, Threatened, or Species of Special Concern Habitat[16], Sea Bird Nesting Islands[17], Shorebird Habitat[18], and bald eagle nests[19] near the proposed lease site.

(6) Source of Organisms to be Cultured

The applicant proposes to source of American/eastern oysters (*Crassostrea virginica*) seed from Muscongus Bay Aquaculture; this hatchery is an approved seed source by MDMR.

(7) Interference with Public Facilities

The proposed lease is not within 1,000 feet of any beach, park, docking facility, or conserved lands owned by federal, state, or municipal governments (Figure 6). The closest publicly owned parcel is Dry Island, which is owned by the Maine Bureau of Parks and Lands and is located approximately 1,375 feet to the northeast of the proposed lease at mean low water. Access to and use of Dry Island is unlikely to be impacted by the proposal.

[15] Data obtained from MDIWF maintained SDE Feature Class "GISVIEW.MEIFW.Twwh"
[16] Data obtained from MDIWF maintained SDE Feature Class "GISVIEW.MEIFW.ETSC"
[17] Data obtained from MDIWF maintained SDE Feature Class "GISVIEW.MEIFW.sni"
[18] Data obtained from MDIWF maintained SDE Feature Class "GISVIEW.MEIFW.Shorebird"
[19] Data obtained from USFWS: https://services.arcgis.com/QVENGdaPbd4LUkLV/ArcGIS/rest/services ("Maine_Bald_Eagles_2019_with_twn_cnty")

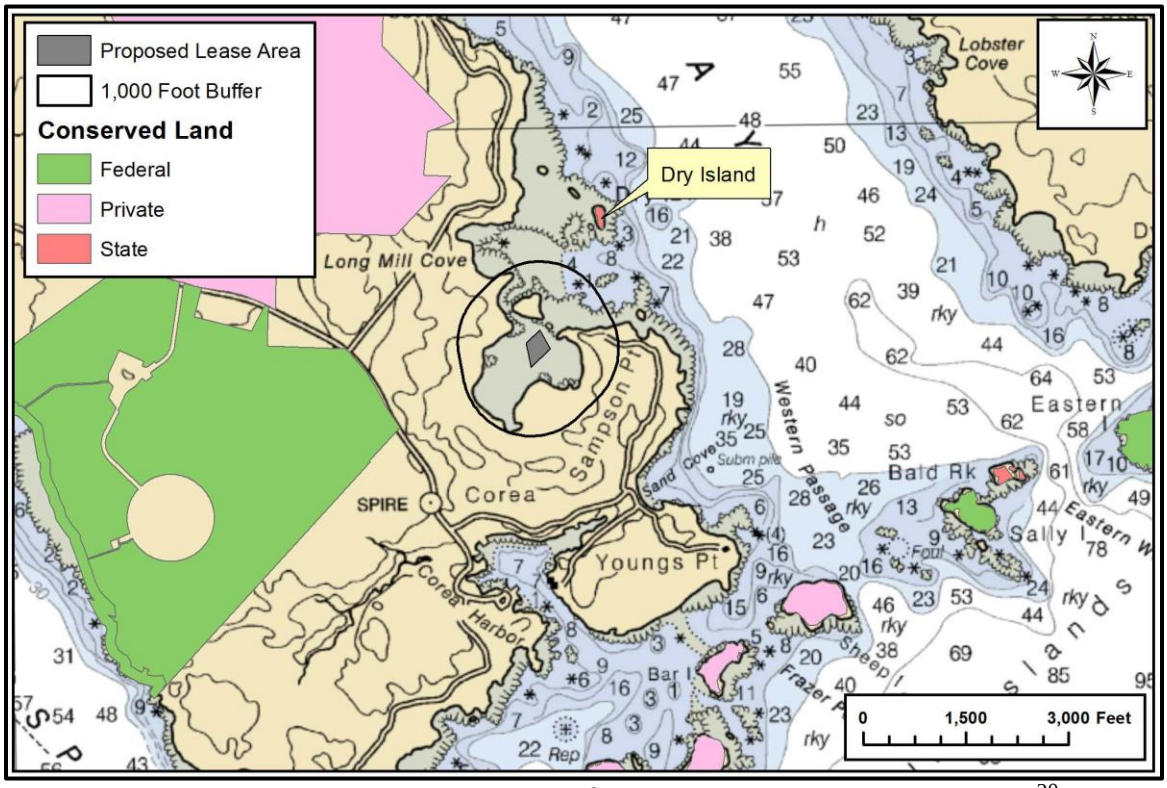

Figure 6. Conserved land and public facilities near the proposed lease site.[20]

(8) Water Quality

The proposed lease area is currently classified as "Open/Approved" for the harvest of shellfish by the MDMR Bureau of Public Health.

(9) Lighting

The applicant does not propose the use of lights on the lease site.[21]

(10) Noise

According to the application, several boats less than 12 feet in length would be used to transport oysters to and from the lease.[22] The applicant would either row these vessels, pull them behind him as he walked through the proposed site, or power them with an electric, battery-powered trolling motor. No other powered equipment is proposed.[23]

(11) Visual Impact

The proposal complies with the MDMR's height and visual impact limitations.

[20] Data obtained from SDE Feature Class sourced from The Maine Office of GIS "GISVIEW.MECONSLANDS.Conserved_Lands"
[21] Application, page 9
[22] Application, page 8
[23] Application, page 9